Improving Communication about Serious Illness (ICSI) Protocol

University of Washington, School of Medicine

Cambia Palliative Care Center of Excellence

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Appendices: screening form; JUMPSTART materials; chart abstraction manual; questionnaires

I.   Personnel

Principal Investigator:
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Swedish Research Staff:
Dr. Warren Fein, Local Investigator and Study Sponsor
Ms. Reda Tipton, Research Project Coordinator
Mr. Jake Graffe, Research Coordinator

Intervention Team: The Intervention Team, led by Dr. Curtis, is responsible for all aspects of the intervention, including refinement of the intervention tools, clinician training, and implementation of the intervention.

Evaluation Team: The Evaluation Team, led by Dr. Engelberg with support from Dr. Lober and Ms. Downey, is responsible for data collection, outcome measurement, and data analysis.

II.   Administration

Study Sponsor / Funding Agency: Patient Centered Outcomes Research Institute (PCORI)
Contract # IH-12-11-4956; Health System Intervention to Improve Communication about End-of-Life Care for Vulnerable Patients
August 1, 2013 – January 31, 2017

Human Subjects: UW IRB #44023, Committee G
Initial approval date: 13 December 2012
Annual renewal [1]:   6 December 2013
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Annual renewal [3]:   6 November 2015 [12/6/15 through 12/5/18]
            *Northwest ROC approval: 16 August 2013
            *Valley ROC approval: 19 July 2013

DSMB: The Data Safety Monitoring Board was convened on December 17, 2013. At this initial meeting the charter was reviewed and approved. The voting membership of the DSMB at the initiation of the study is as follows.

Chair:
- Jean S. Kutner, MD, MSPH, University of Colorado School of Medicine

Members:
- Patrick Judson Blatchford, PhD, University of Colorado Denver
- Rebecca Sudore, MD, University of California, San Francisco
- Karen E. Steinhauser, PhD, Duke University

ClinicalTrials.gov: The study has been registered with ClinicalTrials.gov registry and results database: http://clinicaltrials.gov/show/NCT01933789.

III.   Community Advisory Board

This research study is utilizing the resources of the Cambia Palliative Care Center of Excellence (PCCE). The Cambia PCCE has a Community Advisory Board (CAB) made up of patients, family members and other stakeholders (e.g., clinicians, patient advocates, community representatives). The Board has provided feedback on the specific aims and proposed methods. The study teams meet with Board on a quarterly basis to review progress, assess plans for the coming quarter, and discuss any potential changes in the intervention or evaluation plans. The agendas for these meetings are developed jointly by Drs. Curtis and Engelberg and the chair of the CAB. Members of the Board are provided an honorarium in accordance with the rules and regulations of the University of Washington.

IV.   Objectives and Aims

The goal of this research is to ensure that patients receive the end-of-life care they desire through improved patient-centered communication with the clinicians and interdisciplinary teams caring for these patients. The specific aims include evaluating the effect of a health system intervention (a "Jumpstart" feedback form) designed to improve: the occurrence and quality of patient-centered communication about end-of-life care for patients with chronic life-limiting illness and their families; 2) agreement between patients' preferences for care and care received; and 3) symptoms of anxiety and depression experienced by patients and families.

- Aim 1: Evaluate the effect of the intervention on facilitating and improving patient-clinician communication about end-of-life care for patients with chronic life-limiting illness. The primary outcome is the occurrence of patient-clinician communication about end-of-life care for patients who desire such communication. We will also assess the intervention's effect on all patients' ratings of the quality of this communication.
- Aim 2: Assess the effect of the intervention on ensuring that patients with life-limiting illness receive desired care as measured by: a) concordance between care patients want and care they receive; b) use of palliative care services for patients with unmet palliative care needs; and c) use of intensive life sustaining treatments at the end of life for patients reporting they don't want such treatments.
- Aim 3: Evaluate the effect of the intervention on patients' and families' symptoms of anxiety and depression in the context of receiving care for a life-limiting illness.

V.   Subjects, Inclusion and Exclusion Criteria

The study recruits from UW Medicine --including University of Washington Medical Center (UWMC), Harborview Medical Center (HMC), Northwest Hospital & Medical Center (NW), and Valley Medical Center (VMC). UWMC includes the main medical center, the clinics at Roosevelt Medical Center, and the Neighborhood Clinics under the UW Physicians network. Affiliate clinics at NW and VMC are also included, e.g. Western Washington Cardiology (NW) and the Southlake Clinics (VMC).

The study also recruits from Swedish Medical Center via the Primary Care Clinics with assistance from the Clinical Trials Unit.

The main study subjects are "Primary Clinicians" (physicians, nurse practitioners, physician assistants) and "Patients". We also recruited "Family Members" and "Team Members / Interprofessional Clinicians" (nurses, social workers, medical assistants.

Primary clinicians (n=120). Eligible primary clinicians include all clinicians who provide ongoing primary or specialty care to eligible patient populations. This includes physicians (e.g. family medicine, internal medicine, oncologists, pulmonologists, cardiologists, gastroenterologists, nephrologists, and geriatricians), nurse practitioners, and physician assistants.   A primary role denotes any clinician for whom having a discussion about end-of-life care with eligible patients would be indicated.

Patients (n=500). We enroll up to 6 patients per primary clinician. Eligible patients will be those under the care of the participating primary clinician and who are 18 years of age or older, have had 2 or more visits with the primary clinician in the last 18 months, have an upcoming appointment on record (or a reasonable expectation of an upcoming appointment – e.g. "RTC 3 months"), and meet one of the diagnostic criteria. The diagnostic criteria include the following, with the goal of identifying patients with a median survival of about 2 years:
- Metastatic cancer **or** inoperable lung cancer;
    - Cancer that has spread from primary site to another organ or system; most common sites of cancer metastasis are bone, liver, and lung; can be indicated by Stage IV cancer; can be indicated by M1 in the TNM system [Primary Tumor (T)/Regional Lymph Nodes (N)/Distant Metastasis (M)]; does NOT include mets to nodes or mets to same system (e.g. uterine and fallopian = removal is curative)
    - Includes Stage III non-small cell lung cancer (NSCLC)
    - Note about Cancer screening: Due to some uncertainties and concerns with these cancer patients at UW/SCCA, before entering new patients into the database, the research nurse will review and confirm eligibility. If a diagnosis of Cancer mets is the ONLY reason that the patient is eligible, and that cancer is well controlled, cured/curative, etc. then that patient is probably NOT appropriate for enrollment under the oncologist. HOWEVER, if the patient is eligible by any of the other eligibility criteria, then that patient is eligible for the study, even for enrollment under the oncologist.
- Chronic obstructive pulmonary disease (COPD) with FEV1 values < 35% predicted (Forced Expiratory Volume represents the amount of air that leaves the lung after the first second of a full exhalation) **or** oxygen dependence;
    - Use the most recent pulmonary function measurement; FEV1 unlikely to improve over time so there is no cut-off to when the 'most recent' must be
    - Oxygen dependence is indicated by daily, day-time use of supplemental oxygen (ICD9 V46.2, ICD-10 Z99.81); O2 use that is limited to overnight or sleeping only is not applicable

- Restrictive lung disease with a TLC < 50% predicted (Total Lung Capacity is the total volume of gas contained in the lungs.);
- New York Heart Association Class III **or** Class IV heart failure;
- LVAD (Left Ventricular Assist Device) **or** ICD (Implantable Cardioverter Defibrillator) with age over 65 years;
- Child's Class C cirrhosis or Model for End-Stage Liver Disease (MELD) score of >17;
  - Also known as the Child-Pugh score or the Child-Turcotte-Pugh score. Note: although Child-Pugh calculators are available online using lab values and clinical indicators, we are using available scores in the EHR and not scoring this ourselves
  - MELD calculators are available online using lab values, bilirubin, INR, and creatinine: http://www.hepatitisc.uw.edu/go/management-cirrhosis-related-complications/liver-transplantation-referral/calculate-meld-score
  - For MELD scores between 10-19, 3-month mortality is 6 %
- Dialysis-dependent renal failure **and** either diabetes **or** a serum albumin of < 2.5;
  - Terminology to consider includes CKD (chronic kidney disease), kidney failure, end-stage renal disease (ESRD), diabetic nephropathy, diabetic kidney disease (DKD)
  - Record most recent lab values
- Pulmonary arterial hypertension with 6MWD (6-minute walking distances) <250;
- Restrictive lung disease (idiopathic pulmonary fibrosis, interstitial lung disease) w/ TLC (total lung capacity) <50%;
  - Includes idiopathic pulmonary fibrosis, interstitial lung disease; look for documentation and use the most recent pulmonary function measurement
- Cystic fibrosis with FEV1 < 30%;
  - use the most recent pulmonary function measurement
- Age 75 years or older with at least one life-limiting chronic illness;
  - Consider any of the classifications/diagnoses above (cancer, COPD, heart failure, PAH, cirrhosis, ESLD, renal failure, IPF, ILD, CF) that are not severe enough to be eligible outright but will be for this age group.
    - Example: 80-year-old patient with NYHA2; document diagnosis on the screening form
- Age 90 years or older;
- Hospitalization from any cause within the last 18 months with diagnosis of lesser severity;
  - Consider any of the classifications/diagnoses above (as noted) that are not severe enough to be eligible outright but will be in combination with a hospitalization in the last 18 months
  - Hospitalization may be unrelated to primary diagnosis; document date and reason for hospitalization on the screening form
    - Example: a 70-year-old patient with COPD who was hospitalized 6 months ago for a fall;

  - For diagnoses that may have frequent (e.g. CF) or curative (cancer) hospitalizations, this criterion alone will not be sufficient for eligibility
  - All patients who would be eligible by this criterion must be reviewed by the research nurse before being accepted
- Total comorbidity, Charlson index score >=6.
  - Scores are identified from standard review of the 'Problem List' and office visit documentation at the time of screening
  - Information on the Charlson Index can be obtained at: http://www.rtog.org/LinkClick.aspx?fileticket=8o6FpyC8s9w%3D&tabid=290
  - Modifications to scoring were made in the following areas:
    - AIDS (HIV C3) – Charlson index assigned a value of 6 points; because it is now similar to a chronic disease, we assigned it 1 point

- Cerebrovascular disease and Hemiplegia -- Charlson index noted that if hemiplegia was due to stroke, then CVA was not counted separately, but we **are** counting twice
- Diabetes and Diabetes with organ damage -- Charlson index noted that if there was end organ damage due to diabetes, DM was not counted separately, but we **are** counting twice
- Any tumor in the last 5 years and metastatic solid tumor – For the Charlson index, if there were mets, cancer was not counted separately, but we **are** counting twice
- Myocardial Infarction -- We are including CAD here
- COPD – Charlson index inclusive of asthma, but not for this study
- Diabetes – Charlson index limited to treatment with insulin or oral hypoglycemic, but not for this study (e.g. controlled via diet alone assigned 1 point)
- Points for age – We **are** including these in the total

Exclusion criteria include:
- Non-English speaking
- Significant dementia or cognitive impairment that would limit the patient's ability to complete questionnaires.
- Other reason (e.g. recent transplant, on curative course of treatment) -- document on screening form

Families (n=100). We enroll any family members identified by the patient. Eligible family members are identified by the patient, with the criteria that the patient would want the family member involved in medical decision-making for the patient if the patient was not able OR that the patient identifies the family member as someone involved in his/her medical care. For the purpose of this study, "family member" is not confined to legal next-of-kin or immediate family member. Any family member, friend, or caregiver is eligible who speaks English and has no dementia or delirium limiting ability to complete questionnaires.

Interprofessional (IP) team members (n=5). We enroll any team members identified by the clinician. Most primary clinicians do not have an IP team member working with eligible patients and this information is noted. Eligible IP team members will include nurses, social workers and other clinicians who are part of an enrolled primary clinician's clinic and who deliver care to eligible patients. Primary clinicians assist with the identification of these team members

Reasons for exclusion for all subject groups include: legal or risk management concerns; and physical or mental limitations preventing ability to complete research activities. For patients and family members, participation in the pilot phase is also an exclusion criterion in the full study.

VI.   Pilot Study & Debriefing

Phase one of this research will be a pilot test of the full study design described in detail below. The only differences between the pilot and the full study are:
•   smaller sample size,
•   recruitment from HMC/UWMC only,
•   fewer instruments administered,
•   no chart abstraction, and
•   abbreviated follow-up procedures.
At the end of the pilot activities, there is a short (15-minute) cognitive debriefing interview with subjects to get their thoughts and feelings on the activity and the feedback form itself.

VII.   Methods and Procedures, Full Study

Screening

Primary Clinicians. Primary Clinicians are identified at each site via publicly available lists of providers in each practice or by screening the clinic's electronic health records (EHR) to identify those clinicians with eligible patients in their clinic panels. This requires a waiver of consent and waiver of HIPAA authorization. Where possible, potential Primary Clinicians are identified as those having 10 or more eligible patients and are screened until enrollment targets are achieved. When it is not possible for study staff to screen clinicians for eligibility (e.g., no data from the EHR repository), we directly contact potential clinician subjects and allow them to review our minimal criteria (i.e. ten eligible patients – with the goal of enrolling six – seen over 12-month period) and self-select whether they meet this criteria. Clinicians are also asked to confirm their eligibility at recruitment. At this point, no protected health information or patient identifying information is collected or recorded. The screening is only to assess the clinicians' eligibility, i.e., to confirm that they see a sufficient number of the types of patients that will be eligible for this study.

Patients. Using the medical records/EHR, study staff identify consecutive patients who are cared for by a participating Primary Clinician using the eligibility criteria. Information collected at this point includes: diagnoses, dates of clinic appointments, demographics (sex, ethnicity, race), birth date, medical record number, name, and contact information. This screening requires a waiver of consent and waiver of HIPAA authorization. In the event that a patient sees more than one Primary Clinician who is enrolled in this study, the patient will participate in the study with only a single clinician. At Swedish Medical Center, screening of patient records is conducted by Swedish Medical Center research study staff.

> *Notes on procedures*:
> - Look up patients in medical records/EHR.
>   - Confirm that patient has had enough visits with provider to be eligible.
>   - Check for valid and eligible (~ 40 miles) address and contact information.
>   - Review most recent chart notes for eligibility criteria.
>   - Review problem list for eligibility via comorbidities.
>   - Review for hospitalization within 18 months.
>   - Remember to check for English speaking, cognitive impairment, or other exclusion factors.
> - Complete screening forms for each eligible patient until six patients are found.
>   - If there are not six patients at this time, take whoever is identified.
>   - If there are more than six eligible patients, the database will only permit six open slots at a time, so choose the six best by criteria such as proximity to target date.
> - Record determination of all patients that were screened (e.g. eligible, not eligible, check later, etc.) on the screening sheets for future reference.
> - Record date and MRNs for HIPAA disclosure report; send to RC/ Program Manager.

Recruitment

Primary Clinicians.
Initial recruitment contact procedures:
> 1) Study staff initiate initial contact.   A one-page study summary, invitation and response form are mailed to eligible clinicians, asking them to indicate if they are willing to hear more about the study, provide some demographic data to describe the sample, and collect information about reasons for refusing (as applicable). Reminders were made to non-responders to the initial letter, and included 4

additional attempted contacts. Respondents indicating an interest in participating in the study were then contacted directly by study staff and an in-person enrollment visit is arranged.

2) Study PI initiates initial contact. The study PI makes the initial contact (e.g., phone, email) to practices and clinics with likely eligible clinicians with the goal of introducing the study and assessing acceptability and interest for the clinic as a whole. Study staff continue to approach practice clinicians individually via the recruitment protocols.

Follow-up efforts: Potential clinician subjects who responded to the initial mailing with interest received a second contact from the study (i.e., mail, email, phone, in-person, or via a practice manager or lead clinician). This contact includes additional information about the study and notice that study staff will arrange an enrollment visit. Reminders were made to non-responders to the second letter, and included 4 additional contacts to reach those clinicians who had expressed interest in participating in the study.

Final recruitment: Once contact was made with an interested Primary Clinician and s/he has been made aware of the study purpose and procedures and the parameters for eligibility have been discussed (e.g. panel includes enough seriously ill patients to meet study goals), an enrollment appointment would be set and entered into the database.

Patients. After initial screening, study staff contact the patient by mail for recruitment. Eligible patients receive an introductory letter from the enrolled Primary Clinician with an introductory letter from the study PI. The letters provide a summary of the study and instructions on how to participate or reply to the study mailing. Study staff then contacts the patient by telephone or in person. Study staff summarizes the study, asks if the patient is interested in participating and, if so, arranges to meet for completion of informed consent and baseline survey administration. At Swedish Medical Center, the contact protocol is modified so that the first contact to patients will be will be made by letter from the Swedish research study staff. They will ascertain whether the patient is willing to be contacted by the UW research team. If so, the patient's contact information will be released to the UW team.

Families. Family members are identified by participating patients. If an eligible family member is available at the time of the patient's enrollment, s/he is approached by study staff about participating in the study. If an eligible family member is not present, s/he is approached by mail and by telephone. These family members receive an introductory letter from the study, copies of the consent form, and survey materials with a return envelope. Study staff follow-ups the mailing with a phone call to ensure delivery, answer questions and ascertain the family member's interest in participation.

Interprofessional Team Members. Interprofessional team members identified by Primary Clinicians are initially approached by mail, email, or in person. When necessary, follow-up consists of a phone call or email by study staff to ensure receipt of the introductory packet, answer questions and ascertain the team member's interest in participation. This check-in may also occur in person at the office or clinic of the Primary Clinician.

Enrollment and Informed Consent

All study subjects are approached for consent by UW research study staff. All study staff are trained in the protection of human subjects through the University of Washington or its affiliates (e.g. CITI).

Primary Clinicians. Primary Clinicians meet in person with study staff to compete enrollment. At these enrollment meetings, Primary Clinicians review study materials and complete written informed consent. Signatures are collected at this time to use on the cover letters for patient recruitment.

> *Notes on procedures*: Enrollment appointment for the Primary Clinician (PC) is done in person, importantly to complete informed consent and to collect the PC's signature used for patient

recruitment letters. These appointments usually take no longer than 15 minutes, including collection of baseline data. Study staff brings all materials needed. If possible, the study staff calls the study office during the appointment to find out which study arm the PC has been randomized to. If not possible, study staff assesses assignment after return to the office and emails the participant to let him/her know their randomization status. The video explaining the Jumpstart intervention may be seen at this time or delayed until after randomization assignment.

Subjects who were randomized to the intervention must have a 'training session' logged into the database before being able to proceed. The date for this training session would be the date of the enrollment visit if the PC was shown the video. If the video was not shown, the date for the training session would be the date the randomization result was emailed to the PC; this email contained a link to the video and instructions for viewing.

Before letters to Patients are generated, the Primary Clinician's signature must be logged into the database.

Patients. Patients meet in person with study staff to compete enrollment. At these enrollment meetings, potential patient subjects review study materials, complete written informed consent and HIPAA authorization. For Patients who are assigned to the intervention, they have an opportunity to view the video that explains the Jumpstart form and how it may be used. These appointments can take anywhere from 30 minutes to 2 hours depending on the patient, the conditions surrounding the visit, and numerous other factors. The enrollment appointment should include the collection of baseline data. Study staff bring all materials. Subjects have not completed enrollment until baseline data have been entered in the Access database.

Families. The enrolled Patients will identify the potential family member subjects. Usually if a family member is going to be a participant, s/he is present at the Patient's enrollment appointment and can be recruited and enrolled at the same time. (The Patient's enrollment packet will contain materials for this situation.)

If the family member is identified but not present at the enrollment appointment, his/her name and contact information are entered in the Access database and initial mailings are generated. These include: introductory letter, copies of consent form (a waiver of documentation of consent is in place), baseline survey, and return envelope. Cash payments are sent upon receipt of materials. Follow-up and reminders are made according to protocol – see below. On occasion subjects return questionnaires but neglect to include a copy of the signed consent form. In order to accept the data that these subjects have contributed, we have a Waiver of Written Documentation of Consent. If recruited and enrolled in person, written consent will be obtained.

Interprofessional Team Members. Interprofessional team members receive an introductory mailing that contains copies of the consent form, and survey materials with a return envelope. On occasion subjects return questionnaires but neglect to include a copy of the signed consent form. In order to accept the data that these subjects have contributed, we have a Waiver of Written Documentation of Consent. If recruited and enrolled in person, written consent will be obtained.

Randomization

Primary Clinician participants are assigned to intervention or control. The unit of randomization is the Primary Clinician with Patients, Family Members, and Interprofessional Clinicians clustered under the Primary Clinicians. The study database randomly assigns block sizes of 4, 6, or 8 to each recruitment site. Within randomization blocks, it randomly assigns Primary Clinicians in equal numbers to the intervention and control

conditions, and when a site-specific block is full, it randomly assigns a new block size to the site for the ensuing block. Study staff are blinded to the randomization blocks created in the database. Randomization assignments are made within the database and stored on a network server.

Baseline Data Collection

Primary Clinicians. Baseline data for Primary Clinicians are collected at the time of enrollment. Questionnaires are self-administered, and may be completed on paper or online. Clinicians receive a coffee card ($5) with their baseline survey, or they are mailed this receipt. The baseline questionnaire includes the following:
- Competence in Communication about End-of-Life Care: 17 item self-assessment of perceived competency,
- Demographics.

Patients. Baseline data for Patients are collected at the time of enrollment. Questionnaires are usually self-administered, and may be completed on paper or online. Questionnaires may be administered by study staff in person or by phone, but the format remains the same. Patients receive $5.00 with their baseline survey. The baseline questionnaire includes the following:
- Preference for Care Intensity Preferences: 2 items about preference for intensity of care at end of life from the SUPPORT study, and 2 items about preferences for CPR;
- Communication Barriers & Facilitators: 16 items assess patient-specific barriers and facilitators to end-of-life communication;
- Quality of Communication (QOC_eol): 6 items assess the quality of communication about end-of-life care among patients and family members;
- Trust: 5 items assess respondent's perceived trust of clinician;
- Patient Health Questionnaire (PHQ-8): assesses symptoms of depression among patients and family members;
- Generalized Anxiety Disorder (GAD-7): assesses symptoms of anxiety among patients and family members;
- Religion and Spirituality: 4 items assess respondent's experience and thoughts; and
- Demographics.

Families. Baseline data for Family Members are collected at the time of enrollment. Questionnaires are usually self-administered, and may be completed on paper or online. Questionnaires may be administered by study staff in person or by phone, but the format remains the same. Family Members receive $5.00 with their baseline survey. The baseline questionnaire includes the following:
- Preference for Intensity of Care at End of Life: items addressing the patient's care preferences;
- Trust: 5 items assess respondent's perceived trust of clinician;
- Patient Health Questionnaire (PHQ-8): assesses symptoms of depression among patients and family members;
- Generalized Anxiety Disorder (GAD-7): assesses symptoms of anxiety among patients and family members; and
- Demographics.

Interprofessional Team Members. Baseline data for team members are collected at the time of enrollment. Questionnaires are self-administered, and may be completed on paper or online. Team members receive a coffee card ($5) with their baseline survey. The baseline questionnaire includes the following:
- Skills and Behavior in Practice: 14 item self-assessment of demonstrated skills; and
- Demographics

Engagement

At the time of the patient's enrollment the "target clinic visit" is identified as the next scheduled visit with the enrolled Primary Clinician. This visit, for both intervention and control patients, is the trigger point for the intervention and for scheduling the administration of the follow-up surveys. Tracking target visits consists of daily monitoring for pre-visit mailings (to intervention patients) or phone calls (control patients). Prior to the pre-visit contact, the study staff should confirm the status of the target visit via the patient's EHR.

--- Intervention
The intervention, based on self-efficacy theory, consists of a communication feedback ("Jumpstart") form based on a patient's preferences for communication and training in the use of the form for the clinicians who will be using it. The intervention "feeds back" patient-specific preferences for communication about end-of-life care, patient-specific barriers and facilitators to this communication as identified by patient self-report, and patient preferences for CPR. The Jumpstart form is a short document provided to clinicians, patients, and family members. Jumpstart forms are specific to each patient based on his/her responses to the baseline questionnaire. The Jumpstart forms are tailored to each recipient to support the communication tasks which that recipient will be positioned to address. For example, the form for the clinician includes cues to initiate discussion as well as suggestions for addressing issues with patients who report not wanting to talk about end-of-life care; and the patient and family forms include tips for ways to bring up topics of concern with clinicians as well as between the patient and family.

Upon receipt of the baseline questionnaire, the Jumpstart forms may be created. Patients' baseline questionnaire items included in the intervention feedback are: whether the patient have/ would like to talk to the Primary Clinician about end-of-life care; the patient's care preferences; and primary barrier (or facilitator) they endorsed. Study staff generates the Jumpstart forms based on these responses and then tailors them for each recipient (clinician, patient, family).

Jumpstart forms for the Primary Clinician are provided via secure email or fax ~2 days prior to the patient's target clinic visit and again the morning of the visit. Forms may also be delivered in person to the clinic. As noted above, clinicians in the intervention receive a short training video in the use of the forms at enrollment, and again (via hyperlink) with receipt of the Jumpstart forms. Clinicians in the intervention have the option of delaying discussion about end-of-life care to a subsequent visit if the timing is not appropriate at the target visit. The timing of data collection will not change to ensure comparability between study arms.

In addition to information about patient-specific barriers and facilitators to discussing end-of-life care, clinicians may also receive suggestions about referral to Palliative Care for potentially unmet palliative care communication needs related to end-of-life care. Patients are identified as having potentially unmet palliative care communication needs if they endorse the following items: a) they would like to talk about end-of-life care; b) they have not discussed end-of-life care; and, c) they report an orientation toward ensuring comfort rather than extending life. This triggers a recommendation on the Jumpstart form for the clinician to consider referral to Palliative Care.

The Interprofessional Team Member receives the feedback forms at the same times and using the same methods as the Primary Clinician. The goal of incorporation of the interprofessional team is to use the interprofessional team to reinforce discussions between the clinician and patient and provide support for patients and family.

Jumpstart forms are sent by mail to Patients and to participating Family Members prior to the target clinic visit. In this mailing (forms may also be provided in person at clinic visits) these subjects also receive: cover letter,

link to view Jumpstart video online and/or video summary handout (transcript of video), and study steps checklist (a list of time points for contact i.e. "what you will do in our study… Step 1, complete baseline → Step 5, compete 3-month survey").

--- Control
The control arm constitutes usual care. All participants randomized to the control arm complete the same surveys at all data collection points outlined below, but patient-specific information is not provided to patients, family members, or clinicians. Control subjects receive a call to remind them about the upcoming target visit and that surveys from the study will follow.

Post Data Collection

After the target clinic visit, the follow-up survey schedule begins (post-visit/2 weeks; 3 months; 6 months). This is the same for subjects in the intervention arm and subjects in the control arm.

Clinicians. Primary Clinicians and Interprofessional Team Members complete one post-visit survey for each patient via mail or email/online; they receive a coffee card "thank you" with each survey within 1-2 days of the target visit.

> *Notes on procedures*: All enrolled clinicians are periodically emailed (~ three months) by the RC/Program Manager. These emails consist of study status, status of patient recruitment, and continued thanks for participation.
> 1.   Intervention -- Clinicians receive copies of the Jumpstart forms via email attachment two days prior to the target visits and on the morning of the target visit. Ideally, these emails come from the ICSI email account. Intervention clinicians should receive after-visit surveys within 1-2 working days of the target visit. The target visit should be confirmed via the EHR or other screening system prior to sending by US mail or email. At Swedish, the emails with be reminders only and the Jumpstart forms will be faxed.
> 2.   Control -- Clinicians should receive after-visit surveys within 1-2 working days of the target visit. The target visit should be confirmed via the EHR or other screening system prior to sending by US mail or email.
>
> MAILINGS for Primary Clinicians and Interprofessional Team Members include: personalized letters from database, coffee card ($5.00), questionnaire and return envelope.

Patients and Family Members. Patients have follow-up surveys sent to them for completion at 2-weeks (2W) post target visit. Both patients and family members have follow-up surveys sent to them at 3-months (3M) and 6-months (6M) post target visit. The schedule for all mailings at each of the time points includes: pre-mailing notification phone-call, initial mailing, and follow-up phone call and/or mailing to non-responders. These mailings contain: cover letter, subject payment ($5.00), survey booklet, study steps checklist, return envelope. Surveys may also be completed by phone or online.

> *Notes on procedures*: Before being able to print out follow-up letters, the database will prompt you to make anticipatory calls for 2-weeks, 3-month and 6-month. Voicemail has been approved with careful consideration to confidentiality. Pre-target visit contact will be made via call and/or sending of Jumpstart forms. This call will also serve as reminder for 2-week survey. The 3-month and 6-month calls are straightforward: remind subject of involvement with study and Primary Clinician by name and that survey is coming. These may be completed by phone at the time of the anticipatory call (and then mail subject payment afterwards).

MAILINGS for patient (2W, 3M, 6M) and family (3M, 6M) include: personalized letters from database, updated study steps checklist (intervention or control version), subject payment $5, questionnaire, return envelope.

Questionnaire entry occurs as soon as possible after survey completion or receipt.

Chart abstraction of the patient's medical record (EHR) occurs at the end of the follow-up period. Data elements include: disease characteristics including type and severity; occurrence and documentation of advance care planning; occurrence and timing of hospitalizations including acute care and ICU stays; receipt of life-support measures including CPR and mechanical ventilation; and specialty referrals, consults and visits including palliative care, social work, spiritual care and ethics. [See Appendix for ABSTRACTION MANUAL.]

VIII. Data Elements and Sources

Primary Outcome Variable. Occurrence of communication for patients who indicate a desire to talk with their clinician about end-of-life care is the primary outcome and is evaluated by patient report using a validated dichotomous item. The primary time-point is at 2-weeks; 3-months and 6-months after target visit are additional time-points.

Secondary Outcome Variables. The secondary outcome variables are:
- Quality of Communication about End-of-Life Scale (QOC_eol);
- Care Concordance -- Concordance between the care patients report they want at baseline and the care they report having received at the 3-month assessment is measured with the two questions from SUPPORT. The first question defines patient preferences for either extending life or ensuring comfort. The second question assesses patients' perceptions of current treatment. The outcome is a dichotomous variable measuring whether the preference matches the patient's report of the care received;
- Referral to Palliative Care Services -- Referral to palliative care services for patients who potentially have unmet palliative care communication needs (as determined from the baseline patient questionnaire) is assessed using the electronic health record (EHR). The outcome measure is a binary variable which indicates whether the patient received a referral for palliative care consultation services;
- Provision of Life-Sustaining Therapies -- Review of the EHR assesses use of three indicators of life-sustaining therapies: admission to an ICU, receipt of CPR, and receipt of mechanical ventilation. These analyses include a consideration of patients' preferences for care;
- Generalized Anxiety Disorder (GAD-7); and,
- Patient Health Questionnaire (PHQ-8).

Table 1: Main study measures and data collection protocol

Main Outcome Measures	Concept	Data Collection
I. Aim 1		
Communication items : 1) preference for conversations; 2) occurrence of desired conversations	End-of-life care communication: concordance with preferences and occurrence	**Patients**: enrollment, 2-week, 3-month, 6-month
Quality of Communication: QOC	End-of-life care communication: quality	**Patients**: enrollment, 2-week, 3-month, 6-month
II. Aim 2		
Preference for intensity of care at end of life	Concordance: care preferences matching care received	**Patients**: enrollment, 2-week, 3-month, 6-month
Palliative care referral	Concordance: palliative care referral in those with unmet palliative care needs	**EHR**: end of study period/after-death
ICU admit, receipt of CPR, mechanical ventilation	Concordance: use of life-sustaining treatments matches preferences	**EHR**: end of study period/after-death
III. Aim 3		
Generalized Anxiety Disorder: GAD-7	Symptoms of anxiety	**Patients**, **Family**: enrollment, 3-month, 6-month
Patient Health Questionnaire: PHQ-8	Symptoms of depression	**Patients**, **Family**: enrollment, 3-month, 6-month

Intervention, Covariate Measures	Concept	Data Collection *
Barriers and Facilitators Questionnaire	Patient-specific barriers, facilitators; unmet need for palliative care	**Patients**: enrollment
Competence In Communication And End-of-Life Care	Self-assessment of competency delivering end-of-life care	**Clinicians**: enrollment
Clinician Communication and Visit Checklist	Communication occurrence	**Clinicians**: post-target visit

IX. Data Management and Quality Control

It is necessary to record direct subject identifiers for the purpose of tracking subjects through the enrollment and evaluation phases of the study. This information consists of the names of subjects, contact information (e.g. address, email, telephone), and institutional identification numbers (e.g. medical record numbers for patients). To protect against disclosure, all subjects are assigned a unique study identification number at the time of data entry. It is this number that accompanies study materials and data. The information that would allow for a link between this study ID number and the direct identifiers is kept securely and separately from this data. The links for subject identifiers are to be destroyed no later than three years after the study end-date or by November 30, 2020.

This project requires the creation, maintenance, and analysis of a multivariate, longitudinal and clustered database that includes a variety of measures from multiple sources and sites. Systematic data collection, quality control, and data-management procedures are: 1) specification and use of concise protocols for data entry; 2) rigorous training, certification, and periodic re-training of study staff, with ongoing monitoring of adherence to data collection protocols; 3) regular review of questionnaire response rates and missing items to identify and correct problem areas; 4) verification of all data collected through use of custom-designed data entry systems; and 5) twice-monthly study-team meetings and progress reports to provide specific feedback to project staff concerning potential difficulties as well as follow-up to ensure that problems are resolved quickly.

To guarantee reliability and validity of EHR data, study staff uses current program methods for training and quality control. Abstractors undergo 40 hours of training including instruction on the protocol, guided practice review, and independent review followed by reconciliation with a trainer. A 5% random sample of all records is re-abstracted.

<u>Data Entry</u>.

A.   Missing Values
- 555 = "unintelligible or irreconcilable"; endorsed incompatible items, or respondent writes in own text to change a question
- 666 = "not asked"; info not collected by survey (seen with different versions, or if pages are missing)
- 777 = "refused"; no answer and was not following defined skip pattern
- 888 = "n/a"; not answered because of defined skip pattern or allowable 'not applicable'
- 999 = "don't know"; respondent writes "not sure" or "I don't remember" or "?", etc.

B.   General Coding Conventions
- For Yes/No items, if respondent writes "possibly" or any other positive response, treat this as a "Yes" response.
- If a respondent circles the words "Almost Perfect" on the scale, it is coded as a 10. If a respondent circles the words "Terrible" it is coded as a "0".
- If "none" is a response option, but the respondent does not circle anything, code as refused "777"; do not assume "none" if nothing is selected.
- If a respondent endorses a value on a scale, but also selects a missing option, use the endorsed value.
- If two consecutive numbers are circled or written in, use a random numbers list or coin-flip to determine the response: 1 or 'tails'= Use lower of the two responses; 2 or 'heads'= Use higher of the two responses.

C.   Back-coding

1.   Family relationship – Some relationships are categorized different by different family members. In the past we have tried to standardize these in the following ways:
- "Steps" (e.g. step-brother) – code as ANOTHER RELATIVE
- "Adopted" – code as CHILD, or PARENT
- "Exes" (e.g. ex-wife) – code as ANOTHER RELATIVE
- "In-laws" – code as ANOTHER RELATIVE
- "Caregiver" – code as OTHER
- "Fiancée" – code as SPOUSE/PARTNER

2.   Ethnicity & Race – We use the categories and definitions from the Census for NIH reporting standards. Ethnicity is collected for everyone, so that gets coded no, yes, or refuse including people who endorse any of the other racial categories. Hispanic/Latino respondents who don't want to endorse a race will be coded as "no" for the racial categories, but then enter "Hispanic/Latino" in the text box for "Other" race.
- "Hispanic or Latino" A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race; the term, "Spanish origin" can be used in addition to "Hispanic" and "Latino"
- "American Indian or Alaska Native" A person having origins in any of the original peoples of North and South America (including Central America) who maintains cultural identification through tribal affiliation or community attachment
- "Asian" A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian Subcontinent, including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.
- "Black or African American" A person having origins in any of the black racial groups of Africa
- "Native Hawaiian or Other Pacific Islander" A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands
- "White" A person having origins in any of the original peoples of Europe, the Middle East, or North Africa; includes Caucasian, Persian
- "Race/ethnicity unknown" The category used to report those whose race and ethnicity are not known; also used for "Human" and refusals and skips

X.   Data Analysis

Because all outcomes are specific to clinician-patient pairs, with each clinician serving multiple patient participants, analyses are based on clustered regression models, with patients and families clustered under clinician. The predictor of interest for all models is the clinician's randomization allocation (intervention vs. control), and all models include adjustment for confounders, with confounders defined as variables that alter the size of the coefficient for the intervention by more than 10% when added as a second predictor of the outcome of interest. The link function to be used in each regression model is determined by the distribution of the outcome variable, with the estimator for model coefficients following best practices for the selected link function: linear and logistic regression models estimated with restricted maximum likelihood; probit and tobit models with either restricted maximum likelihood or weighted mean- and variance-adjusted least squares. Analysis defines continuous (or pseudo-continuous) outcomes as censored, and uses a tobit link for regression models, if more than 25% of responses are at the minimum or maximum values on the response scale. Analyses are based on intention to treat. The final regression model for each outcome includes the predictor of interest (the control/intervention indicator) and any covariates that act as true confounders of the association between that predictor and the outcome. A $p<0.05$ was selected as signifying statistical significance for the primary outcome. In addition to constructing the regression models detailed below, testing the intervention's effect on each outcome at that outcome's primary follow-up point, the analysis also compares the control and intervention groups' values on outcomes at other time points with the goal of providing insights into the intervention's durability of effect and generating hypotheses for future studies. Analysis also explores differences in perspective between clinicians and patient/family participants regarding whether end-of-life discussions occurred, and we will do exploratory analyses of heterogeneity of treatment effects.

Analyses for Specific Aims

Analysis for Aim 1: assessing the intervention's effect on occurrence of communication about end-of-life care for patients who want this communication and on the quality of communication about end-of-life care.

The intervention's effect on the occurrence of communication about end-of-life care for patients who desire it is assessed with a clustered regression model (logistic or probit) appropriate for a Bernoulli outcome collected at the assessment 2 weeks after the target visit, and with adjustment for confounders. The primary analyses will examine this outcome among the denominator of all patients who indicate at enrollment a desire for discussion about end-of-life care or who indicate "I don't know" to this question and who indicate at 2-week follow-up whether such a discussion occurred after enrollment. The sample includes patients who report having already had discussions with their clinician, as well as those for whom no such discussion had occurred prior to enrollment, because these discussions should not be a one-time event. The primary outcome examines the proportion of these patients who report on the after-visit survey (at 2 weeks post-target vist) that a discussion occurred. In addition, we will also compare the proportion who reported that a discussion occurred for all patients completing the after-visit survey.

The intervention's effect on the quality of communication about end-of-life care is assessed with the composite QOC_eol outcome, also collected 2 weeks after the target visit. The QOC_eol composite score will be tested for unidimensionality and between-group measurement invariance to ensure that the most appropriate composite score is used as an outcome. We will use a clustered linear regression model, estimating the coefficient for the outcome regressed on the control/intervention predictor, after adjustment for the baseline QOC_eol score and any other variables that act as confounders. The sample includes all patients for whom the QOC_eol score can be computed at both baseline and the 2-week follow-up assessment. In addition to these analyses, we will also examine each QOC_eol item as individual outcomes.

Analysis for Aim 2: assessing the intervention's effect on several outcomes measuring the match between the treatment patients receive and their treatment wishes.

The intervention's effect on concordance between care desired and care received is tested with a clustered logistic/ probit regression model, using a dichotomous outcome based on patient responses at baseline and the 3-month follow-up. Analyses will include the following approaches: 1) the sample will include all patients who completed the 3-month survey and whose stated treatment preference is the same at baseline and 3 months. Care is deemed concordant if the preference at baseline and 3 months is quality of life and the patient reports at 3 months that current medical care is focused on relieving discomfort, or if the preference at baseline and 3 months is on extension of life and the patient reports at 3 months that current medical care has that focus; and 2) the sample will include all patients who completed the 3-month survey; care will be deemed concordant if the preference for care and the assessment of current care are concordant at the 3-month assessment. The regression model includes adjustment for the patient's orientation toward quality of life/comfort care vs. life-sustaining therapies, plus any confirmed confounders of the association between randomization assignment and concordance. Analysis also examines the intervention effect on the subgroups that desire care focused on comfort as compared with those that desire care focused on sustaining life.

The intervention's effect on referrals to palliative care services for patients with unmet needs is tested with a clustered logistic/probit regression model, adjusted for confounders, and using a dichotomous outcome based on EHR review. The outcome indicates whether the patient was referred to palliative care services during the 3-month period following the target visit. The sample includes all patients who, at baseline, indicate that they have never discussed end-of-life care with their clinician, that they would like such a discussion, and that their preference is for care focused on comfort, rather than on extending life. We will also examine referrals to palliative care services for all patients who, at any assessment point, indicated that they preferred treatment focused on comfort and that (additional) discussion was desired. Finally, we will examine referrals to palliative care services for all patients in the intervention group compared to the control group.

The intervention's effect on reducing unwanted life-sustaining therapies will be tested over the 6-month follow-up period with clustered logistic/probit regression models, adjusted for confounders, and using a dichotomous outcome based on the EHR. The outcome indicates whether patients received any of the three-targeted life-sustaining therapies (i.e., admission to the ICU, receipt of CPR, receipt of mechanical ventilation). The sample includes patients whose preferences indicate that they want care focused on comfort, and these preferences will be ascertained from the time period closest to the hospitalization during which life-sustaining therapies were received. In addition, secondary analyses will compare utilization of any of the three-targeted life-sustaining therapies by all patients randomized to intervention vs. control across the full 6-month follow-up.

Analysis for Aim 3: assessing the intervention's effect on patients' and family members' anxiety and depression 3 months after the target visit.

Anxiety is assessed with the GAD-7 anxiety score (a continuous scale with 0-21 range); depression is assessed with the PHQ-8 depression score (a continuous scale with 0-27 range). These scores will be tested for unidimensionality and between-group measurement invariance to ensure that the most appropriate composite score is used as an outcome. The test is based on clustered regressions, with outcomes (i.e., patient anxiety, patient depression, family anxiety, family depression) regressed on the randomization predictor, after adjustment for the baseline score of the outcome measure and for other confounders.

<u>Subgroup Analyses</u>

In addition to the regression models specified for the full sample, analysis tests the same regression models outlined above, but within subgroups. In particular, this looks at groups defined by patient race/ethnicity and the presence of the following chronic illnesses, including cancer, lung disease, liver disease, kidney disease, and heart disease.

<u>Handling of missing data</u>

The primary approach to missing data (either missing measures or missing responses within a measure) is to minimize it by reducing respondent burden, offering multiple methods for survey completion, and having trained staff in frequent contact with participants. Indirect tests of the mechanism of missingness are explored by examining: 1) baseline characteristics of those who ever and never missed, by treatment group allocation; and 2) the difference between mean outcome scores of patients with missing vs. non-missing data. To address missing data, the study will use two approaches: 1) a FIML approach that allows for the use of all available data for each regression model; and 2) propensity scoring. Although multiple imputation models are available, some of the assumptions of MI models (e.g., continuous outcomes, assignment of imputed values that are outside the range of permissible values) make it less attractive than these other methods. Sensitivity analyses will be used to explore the effect of differing assumptions and methods on the results, and we will report these results.

<u>Avoidance of bias</u>

Bias is minimized by the RCT design in which clinicians are randomly assigned to control or intervention. Other potential sources of bias that are important to address include:
- Potential respondent bias in an unblinded study -- The intervention precludes blinding clinicians, patients, or family. This could introduce bias if patients or family in the intervention arm give different ratings for reasons other than the intervention (i.e. they want to please researchers). However, intervention and control participants receive the same contact with study staff, which mitigates this potential source of bias.
- Non-participation and loss-to-follow-up -- Patients, families, and clinicians who agree to participate may be different from those who decline. Many patients or families who refuse may also refuse to participate in this intervention in clinical practice. This mitigates the effect that non-response bias has on the generalizability of the findings. Nonetheless, data on response rates and basic data on non-respondents is collected to allow for estimates on the magnitude of this potential bias.
- Contamination -- Because Enrolled Primary Clinicians may work in clinics and within teams that are shared by other enrolled clinicians, it is theoretically possible that contamination through the teams could result in improved care delivered to the patients of control clinicians. This is unlikely to have a major effect because the primary hypothesis and preliminary data suggest care is unlikely to improve without the patient-specific feedback provided by the intervention for which the "phase II" study showed efficacy. While the study cannot control for potential contamination, analyses can look for improved outcomes in the control group over time as a way to identify a potential contamination effect. Since contamination would bias results toward the null hypothesis, the results will provide a conservative estimate of an intervention effect.

XI. Publications about Study Procedures

Information about the study is published on the web at:
- Patient-Centered Outcomes Research Institute, http://www.pcori.org/assets/PCORI-PFA-Cycle-II-Awardees-050613.pdf
- UW End-of-Life Care Research Program, http://depts.washington.edu/eolcare/current-research/pcori-icsi/
- ClinicalTrials.gov, http://clinicaltrials.gov/show/NCT01933789